General

Guideline Title

Caesarean section.

Bibliographic Source(s)

National Institute for Health and Clinical Excellence (NICE). Caesarean section. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Nov. 57 p. (Clinical guideline; no. 132).

Guideline Status

This is the current release of the guideline.

The guideline updates a previous version: National Collaborating Centre for Women's and Children's Health. Caesarean section. London (UK): National Institute for Clinical Excellence (NICE); 2004 Apr. 142 p.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health on behalf of the National Institute for Health and Clinical Excellence (NICE). See the Availability of Companion Documents field for the full version of this guidance. This guidance is a partial update of NICE clinical guideline 13 (published April 2004) and will replace it.

New and updated recommendations have been included on the risks and benefits of planned caesarean section (CS) compared with planned vaginal birth, care of women considered at risk of a morbidly adherent placenta, appropriate care and choices for women who are human immunodeficiency virus (HIV) positive, care of women requesting a CS without a clinical indication, decision-to-delivery intervals to be used as audit standards, timing of the administration of antibiotics for CS, appropriate care and choices for women who have previously had a CS.

Recommendations are marked as [2004], [2011], or [new 2011]:

- [2004] indicates that the evidence has not been updated and reviewed since 2004.
- [2004, amended 2011] indicates that the evidence has not been updated and reviewed since 2004 but a small amendment has been made to the recommendation.
- [2011] indicates that the evidence has been reviewed but no changes have been made to the recommendation.
- [new 2011] indicates that the evidence has been reviewed and the recommendation has been updated or added.

Women-centred Care

Provision of Information

Pregnant women should be offered evidence-based information and support to enable them to make informed decisions about childbirth. Addressing women's views and concerns should be recognised as being integral to the decision-making process. [2004]

Give pregnant women evidence-based information about caesarean section (CS) during the antenatal period, because about 1 in 4 women will have a CS. This should include information about CS such as:

- Indications for CS (such as presumed fetal compromise, 'failure to progress' in labour, breech presentation)
- What the procedure involves
- Associated risks and benefits
- Implications for future pregnancies and birth after CS [new 2011]

Communication and information should be provided in a form that is accessible to pregnant women, taking into account the information and cultural needs of minority communities and women whose first language is not English or who cannot read, together with the needs of women with disabilities or learning difficulties. [2004]

Planning Mode of Birth

Discuss the risks and benefits of CS compared with vaginal birth with women, taking into account their circumstances, concerns, priorities and plans for future pregnancies (including the risks of placental problems with multiple CS) (see Box A below).[new 2011]

Box A. Planned Caesarean Section Compared with Planned Vaginal Birth for Women with an Uncomplicated Pregnancy and No Previous Caesarean Section

Planned caesarean section may reduce the risk of the following in women:

- Perineal and abdominal pain during birth and 3 days postpartum
- Injury to vagina
- Early postpartum haemorrhage
- Obstetric shock

Planned caesarean section may increase the risk of the following in babies:

- Neonatal intensive care unit admission

Planned caesarean section may increase the risk of the following in women:

- Longer hospital stay
- Hysterectomy caused by postpartum haemorrhage
- Cardiac arrest

Please refer to Tables 1 and 2 in Appendix C in the original guideline for full details, including the absolute and relative risks for each effect.

Consent for CS should be requested after providing pregnant women with evidence-based information and in a manner that respects the woman's dignity, privacy, views, and culture, while taking into consideration the clinical situation. [2004]

A pregnant woman is entitled to decline the offer of treatment such as CS, even when the treatment would clearly benefit her or her baby's health. Refusal of treatment needs to be one of the patient's options. [2004, amended 2011]

When the decision is made to perform a CS, a record should be made of all the factors that influence the decision, and which of these is the most influential. [2004, amended 2011]

Planned CS

Breech Presentation

Women who have an uncomplicated singleton breech pregnancy at 36 weeks' gestation should be offered external cephalic version. Exceptions include women in labour and women with a uterine scar or abnormality, fetal compromise, ruptured membranes, vaginal bleeding, or medical conditions. [2004]

Pregnant women with a singleton breech presentation at term for whom external cephalic version is contraindicated or has been unsuccessful should be offered CS because it reduces perinatal mortality and neonatal morbidity. [2004]

Multiple Pregnancy

In otherwise uncomplicated twin pregnancies at term where the presentation of the first twin is cephalic, perinatal morbidity and mortality is increased for the second twin. However, the effect of planned CS in improving outcome for the second twin remains uncertain and therefore CS should not routinely be offered outside a research context. [2004]

In twin pregnancies where the first twin is not cephalic, the effect of CS in improving outcome is uncertain, but current practice is to offer a planned CS. [2004]

Preterm Birth and CS

Preterm birth is associated with higher neonatal morbidity and mortality. However, the effect of planned CS in improving these outcomes remains uncertain and therefore CS should not routinely be offered outside a research context. [2004]

Small for Gestational Age and CS

The risk of neonatal morbidity and mortality is higher with 'small for gestational age' babies. However, the effect of planned CS in improving these outcomes remains uncertain, and therefore CS should not routinely be offered outside a research context. [2004]

Placenta Praevia

Women with a placenta that partly or completely covers the internal cervical os (minor or major placenta praevia) should be offered CS. [2004, amended 2011]

Morbidly Adherent Placenta

If low-lying placenta is confirmed at 32–34 weeks in women who have had a previous CS, offer colour-flow Doppler ultrasound as the first diagnostic test for morbidly adherent placenta. [new 2011]

If a colour-flow Doppler ultrasound scan result suggests morbidly adherent placenta:

- Discuss with the woman the improved accuracy of magnetic resonance imaging (MRI) in addition to ultrasound to help diagnose morbidly adherent placenta and clarify the degree of invasion.
- Explain what to expect during an MRI procedure.
- Inform the woman that current experience suggests that MRI is safe, but that there is a lack of evidence about any long term risks to the baby.
- Offer MRI if acceptable to the woman. [new 2011]

Discuss the interventions available for delivery with women suspected to have morbidly adherent placenta, including cross matching of blood and planned CS with a consultant obstetrician present. [new 2011]

When performing a CS for women suspected to have morbidly adherent placenta, ensure that:

- A consultant obstetrician and a consultant anaesthetist are present
- An experienced paediatrician is present
- A senior haematologist is available for advice
- A critical care bed is available
- Sufficient cross-matched blood and blood products are readily available [new 2011]

When performing a CS for women suspected to have morbidly adherent placenta the consultant obstetrician should decide which other healthcare professionals need to be consulted or present. [new 2011]

All hospitals should have a locally agreed protocol for managing morbidly adherent placenta that sets out how these elements of care should be provided. [new 2011]

Predicting CS for Cephalopelvic Disproportion in Labour

Pelvimetry is not useful in predicting 'failure to progress' in labour and should not be used in decision making about mode of birth. [2004]

Shoe size, maternal height, and estimations of fetal size (ultrasound or clinical examination) do not accurately predict cephalopelvic disproportion and should not be used to predict 'failure to progress' during labour. [2004]

Mother-to-Child Transmission of Maternal Infections

HIV

As early as possible give women with HIV information about the risks and benefits for them and their child of the HIV treatment options and mode of birth so that they can make an informed decision. [new 2011]

Do not offer a CS on the grounds of HIV status to prevent mother-to-child transmission of HIV to:

- Women on highly active anti-retroviral therapy (HAART) with a viral load of less than 400 copies per ml or
- Women on any anti-retroviral therapy with a viral load of less than 50 copies per ml

Inform women that in these circumstances the risk of HIV transmission is the same for a CS and a vaginal birth. [new 2011]

Consider either a vaginal birth or a CS for women on anti-retroviral therapy (ART) with a viral load of 50–400 copies per ml because there is insufficient evidence that a CS prevents mother-to-child transmission of HIV. [new 2011]

Offer a CS to women with HIV who:

- Are not receiving any anti-retroviral therapy or
- Are receiving any anti-retroviral therapy and have a viral load of 400 copies per ml or more. [new 2011]

Researchers and national bodies responsible for the collection of UK population data should continue to collect data about HIV diagnoses in pregnant women, including treatment, mode of birth, and mother-to-child transmission rates. [new 2011]

Hepatitis B Virus

Mother-to-child transmission of hepatitis B can be reduced if the baby receives immunoglobulin and vaccination. In these situations pregnant women with hepatitis B should not be offered a planned CS, because there is insufficient evidence that this reduces mother-to-child transmission of hepatitis B virus. [2004]

Hepatitis C Virus

Women who are infected with hepatitis C should not be offered a planned CS because this does not reduce mother-to-child transmission of the virus. [2004]

Pregnant women who are co-infected with hepatitis C virus and HIV should be offered planned CS because it reduces mother-to-child transmission of both hepatitis C virus and HIV. [2004]

Herpes Simplex Virus

Women with primary genital herpes simplex virus (HSV) infection occurring in the third trimester of pregnancy should be offered planned CS because it decreases the risk of neonatal HSV infection. [2004]

Pregnant women with a recurrence of HSV at birth should be informed that there is uncertainty about the effect of planned CS in reducing the risk of neonatal HSV infection. Therefore, CS should not routinely be offered outside a research context. [2004]

Maternal Request for CS

When a woman requests a CS explore, discuss and record the specific reasons for the request. [new 2011]

If a woman requests a CS when there is no other indication, discuss the overall risks and benefits of CS compared with vaginal birth and record that this discussion has taken place (see Box A above). Include a discussion with other members of the obstetric team (including the obstetrician, midwife and anaesthetist) if necessary to explore the reasons for the request, and to ensure the woman has accurate information. [new 2011]

When a woman requests a CS because she has anxiety about childbirth, offer referral to a healthcare professional with expertise in providing perinatal mental health support to help her address her anxiety in a supportive manner. [new 2011]

Ensure the healthcare professional providing perinatal mental health support has access to the planned place of birth during the antenatal period in order to provide care. [new 2011]

For women requesting a CS, if after discussion and offer of support (including perinatal mental health support for women with anxiety about childbirth), a vaginal birth is still not an acceptable option, offer a planned CS. [new 2011]

An obstetrician unwilling to perform a CS should refer the woman to an obstetrician who will carry out the CS. [new 2011]

Body Mass Index

Do not use body mass index (BMI) of over 50 alone as an indication for planned CS. [new 2011]

Factors Affecting Likelihood of CS during Intrapartum Care

Place of Birth

During their discussions about options for birth, healthy pregnant women with anticipated uncomplicated pregnancies should be informed that planning a home birth reduces the likelihood of CS. [2004, amended 2011]

During their discussions about options for birth, healthy pregnant women with anticipated uncomplicated pregnancies should be informed that planned childbirth in a 'midwifery-led unit' does not reduce the likelihood of CS. [2004]

Factors Reducing the Likelihood of CS

Women should be informed that continuous support during labour from women with or without prior training reduces the likelihood of CS. [2004]

Women with an uncomplicated pregnancy should be offered induction of labour beyond 41 weeks because this reduces the risk of perinatal mortality and the likelihood of CS. [2004]

A partogram with a 4-hour action line should be used to monitor progress of labour of women in spontaneous labour with an uncomplicated singleton pregnancy at term, because it reduces the likelihood of CS. [2004]

Consultant obstetricians should be involved in the decision making for CS, because this reduces the likelihood of CS. [2004]

Electronic fetal monitoring is associated with an increased likelihood of CS. When CS is contemplated because of an abnormal fetal heart rate pattern, in cases of suspected fetal acidosis, fetal blood sampling should be offered if it is technically possible and there are no contraindications. [2004]

No Influence on Likelihood of CS

Women should be informed that the following interventions during intrapartum care have not been shown to influence the likelihood of CS, although they may affect other outcomes that are outside the scope of this guideline:

- Walking in labour
- Non-supine position during the second stage of labour
- Immersion in water during labour
- Epidural analgesia during labour
- Use of raspberry leaves [2004]

Women should be informed that the effects on the likelihood of CS of complementary therapies used during labour (such as acupuncture, aromatherapy, hypnosis, herbal products, nutritional supplements, homeopathic medicines, and Chinese medicines) have not been properly evaluated and further research is needed before such interventions can be recommended. [2004]

'Failure to Progress' in Labour and CS

The following aspects of intrapartum care have not been shown to influence the likelihood of CS for 'failure to progress' and should not be offered for this reason, although they may affect other outcomes which are outside the scope of this guideline:

- Active management of labour
- Early amniotomy [2004]

Eating During Labour

Women should be informed that eating a low-residue diet during labour (toast, crackers, low-fat cheese) results in larger gastric volumes, but the effect on the risk of aspiration if anaesthesia is required is uncertain. [2004]

Women should be informed that having isotonic drinks during labour prevents ketosis without a concomitant increase in gastric volume. [2004]

Procedural Aspects of CS

Timing of Planned CS

The risk of respiratory morbidity is increased in babies born by CS before labour, but this risk decreases significantly after 39 weeks. Therefore planned CS should not routinely be carried out before 39 weeks. [2004]

Classification of Urgency

The urgency of CS should be documented using the following standardised scheme in order to aid clear communication between healthcare professionals about the urgency of a CS:

1. Immediate threat to the life of the woman or fetus
2. Maternal or fetal compromise which is not immediately life-threatening
3. No maternal or fetal compromise but needs early delivery
4. Delivery timed to suit woman or staff [2004]

Decision-to-Delivery Interval for Unplanned CS

Perform category 1 and 2 CS* as quickly as possible after making the decision, particularly for category 1. [new 2011]

Perform category 2 CS* in most situations within 75 minutes of making the decision. [new 2011]

Take into account the condition of the woman and the unborn baby when making decisions about rapid delivery. Remember that rapid delivery may be harmful in certain circumstances. [new 2011]

Use the following decision-to-delivery intervals to measure the overall performance of an obstetric unit:

- 30 minutes for category 1 CS*
- Both 30 and 75 minutes for category 2 CS

*Category 1 CS is when there is immediate threat to the life of the woman or fetus, and category 2 CS is when there is maternal or fetal compromise which is not immediately life-threatening.

Use these as audit standards only and not to judge multidisciplinary team performance for any individual CS. [new 2011]

Preoperative Testing and Preparation before CS

Pregnant women should be offered a haemoglobin assessment before CS to identify those who have anaemia. Although blood loss of more than 1000 ml is infrequent after CS (it occurs in 4%-8% of CS), it is a potentially serious complication. [2004]

Pregnant women having CS for antepartum haemorrhage, abruption, uterine rupture, and placenta praevia are at increased risk of blood loss of more than 1000 ml and should have the CS carried out at a maternity unit with on-site blood transfusion services. [2004]

Pregnant women who are healthy and who have otherwise uncomplicated pregnancies should not routinely be offered the following tests before CS:

- Grouping and saving of serum
- Cross-matching of blood
- A clotting screen
- Preoperative ultrasound for localisation of the placenta, because this does not improve CS morbidity outcomes (such as blood loss of more than 1000 ml, injury of the infant, and injury to the cord or to other adjacent structures). [2004]

Women having CS with regional anaesthesia require an indwelling urinary catheter to prevent over-distension of the bladder, because the anaesthetic block interferes with normal bladder function. [2004]

Anaesthesia for CS

Pregnant women having a CS should be given information on different types of post-CS analgesia so that analgesia best suited to their needs can be offered (see recommendations below under Pain Management after CS). [2004]

Women who are having a CS should be offered regional anaesthesia because it is safer and results in less maternal and neonatal morbidity than general anaesthesia. This includes women who have a diagnosis of placenta praevia. [2004]

Women who are having induction of regional anaesthesia for CS should be cared for in theatre because this does not increase women's anxiety. [2004, amended 2011]

Women who are having a CS under regional anaesthesia should be offered intravenous ephedrine or phenylephrine, and volume preloading with crystalloid or colloid to reduce the risk of hypotension occurring during CS. [2004]

Each maternity unit should have a drill for failed intubation during obstetric anaesthesia. [2004]

To reduce the risk of aspiration pneumonitis, women should be offered antacids and drugs (such as H_2 receptor antagonists or proton pump inhibitors) to reduce gastric volumes and acidity before CS.

Women having a CS should be offered antiemetics (either pharmacological or acupressure) to reduce nausea and vomiting during CS. [2004]

General anaesthesia for unplanned CS should include preoxygenation, cricoid pressure, and rapid sequence induction to reduce the risk of aspiration. [2004, amended 2011]

Intravenous ephedrine or phenylephrine should be used in the management of hypotension during CS. [2004]

The operating table for CS should have a lateral tilt of 15°, because this reduces maternal hypotension. [2004]

Surgical Techniques for CS

Methods to Prevent HIV Transmission in Theatre

Healthcare professionals should wear double gloves when performing or assisting at CS on women who have tested positive for HIV, to reduce the risk of HIV infection of healthcare professionals during surgery. [2004]

General recommendations for safe surgical practice should be followed at CS to reduce the risk of HIV infection of staff. [2004]

Abdominal Wall Incision

CS should be performed using a transverse abdominal incision because this is associated with less postoperative pain and an improved cosmetic effect compared with a midline incision. [2004]

The transverse incision of choice should be the Joel Cohen incision (a straight skin incision, 3 cm above the symphysis pubis; subsequent tissue layers are opened bluntly and, if necessary, extended with scissors and not a knife), because it is associated with shorter operating times and reduced postoperative febrile morbidity. [2004]

Instruments for Skin Incision

The use of separate surgical knives to incise the skin and the deeper tissues at CS is not recommended because it does not decrease wound infection. [2004]

Excision of the Uterine Incision

When there is a well formed lower uterine segment, blunt rather than sharp extension of the uterine incision should be used because it reduces blood loss, incidence of postpartum haemorrhage, and the need for transfusion at CS. [2004]

Fetal Laceration

Women who are having a CS birth should be informed that the risk of fetal lacerations is about 2%. [2004]

Use of Forceps

Forceps should only be used at CS if there is difficulty delivering the baby's head. The effect on neonatal morbidity of the routine use of forceps at CS remains uncertain. [2004]

Use of Uterotonics

Oxytocin 5 IU by slow intravenous injection should be used at CS to encourage contraction of the uterus and to decrease blood loss. [2004]

Method of Placental Removal

At CS, the placenta should be removed using controlled cord traction and not manual removal as this reduces the risk of endometritis. [2004]

Exteriorisation of the Uterus

Intraperitoneal repair of the uterus at CS should be undertaken. Exteriorisation of the uterus is not recommended because it is associated with more pain and does not improve operative outcomes such as haemorrhage and infection. [2004]

Closure of the Uterus

The effectiveness and safety of single layer closure of the uterine incision is uncertain. Except within a research context, the uterine incision should be sutured with two layers. [2004]

Closure of the Peritoneum

Neither the visceral nor the parietal peritoneum should be sutured at CS because this reduces operating time and the need for postoperative analgesia and improves maternal satisfaction. [2004]

Closure of the Abdominal Wall

In the rare circumstances that a midline abdominal incision is used at CS, mass closure with slowly absorbable continuous sutures should be used because this results in fewer incisional hernias and less dehiscence than layered closure. [2004]

Closure of Subcutaneous Tissue

Routine closure of the subcutaneous tissue space should not be used, unless the woman has more than 2 cm subcutaneous fat, because it does not reduce the incidence of wound infection. [2004]

Use of Superficial Wound Drains

Superficial wound drains should not be used at CS because they do not decrease the incidence of wound infection or wound haematoma. [2004]

Closure of the Skin

Obstetricians should be aware that the effects of different suture materials or methods of skin closure at CS are not certain. [2004]

Umbilical Artery pH Measurement

Umbilical artery pH should be performed after all CS for suspected fetal compromise, to allow review of fetal well-being and guide ongoing care of the baby. [2004]

Timing of Antibiotic Administration

Offer women prophylactic antibiotics at CS before skin incision. Inform them that this reduces the risk of maternal infection more than prophylactic antibiotics given after skin incision, and that no effect on the baby has been demonstrated. [new 2011]

Offer women prophylactic antibiotics at CS to reduce the risk of postoperative infections. Choose antibiotics effective against endometritis, urinary tract and wound infections, which occur in about 8% of women who have had a CS. [new 2011]

Do not use co-amoxiclav when giving antibiotics before skin incision. [new 2011]

Thromboprophylaxis for CS

Women having a CS should be offered thromboprophylaxis because they are at increased risk of venous thromboembolism. The choice of method of prophylaxis (for example, graduated stockings, hydration, early mobilisation, low molecular weight heparin) should take into account risk of thromboembolic disease and follow existing guidelines (For more information see the NGC summary of Venous thromboembolismin adults admitted to hospital: reducing the risk [NICE clinical guideline 92]). [2004, amended 2011]

Women's Preferences during CS

Women's preferences for the birth, such as music playing in theatre, lowering the screen to see the baby born, or silence so that the mothers voice is the first the baby hears, should be accommodated where possible. [2004]

Care of the Baby Born by CS

Presence of Paediatrician at CS

An appropriately trained practitioner skilled in the resuscitation of the newborn should be present at CS performed under general anaesthesia or where there is evidence of fetal compromise. [2004]

Thermal Care for Babies Born by CS

Babies born by CS are more likely to have a lower temperature, and thermal care should be in accordance with good practice for thermal care of the newborn baby. [2004]

Maternal Contact (Skin to Skin)

Early skin-to-skin contact between the woman and her baby should be encouraged and facilitated because it improves maternal perceptions of the infant, mothering skills, maternal behaviour, and breastfeeding outcomes, and reduces infant crying. [2004]

Breastfeeding

Women who have had a CS should be offered additional support to help them to start breastfeeding as soon as possible after the birth of their baby. This is because women who have had a CS are less likely to start breastfeeding in the first few hours after the birth, but, when breastfeeding is established, they are as likely to continue as women who have a vaginal birth. [2004]

Care of the Woman after CS

High Dependency Unit/Intensive Therapy Unit Admission

Healthcare professionals caring for women after CS should be aware that, although it is rare for women to need intensive care following childbirth, this occurs more frequently after CS (about 9 per 1000). [2004]

Routine Monitoring after CS

After CS, women should be observed on a one-to-one basis by a properly trained member of staff until they have regained airway control and cardiorespiratory stability and are able to communicate. [2004]

After recovery from anaesthesia, observations (respiratory rate, heart rate, blood pressure, pain, and sedation) should be continued every half hour for 2 hours, and hourly thereafter provided that the observations are stable or satisfactory. If these observations are not stable, more frequent observations and medical review are recommended. [2004]

For women who have had intrathecal opioids, there should be a minimum hourly observation of respiratory rate, sedation, and pain scores for at least 12 hours for diamorphine and 24 hours for morphine. [2004]

For women who have epidural opioids or patient-controlled analgesia with opioids, there should be routine hourly monitoring of respiratory rate, sedation, and pain scores throughout treatment and for at least 2 hours after discontinuation of treatment. [2004]

Pain Management after CS

Women should be offered diamorphine (0.3-0.4 mg intrathecally) for intra- and postoperative analgesia because it reduces the need for supplemental analgesia after a CS. Epidural diamorphine (2.5-5 mg) is a suitable alternative. [2004]

Patient-controlled analgesia using opioid analgesics should be offered after CS because it improves pain relief. [2004]

Providing there is no contraindication, nonsteroidal anti-inflammatory drugs should be offered post-CS as an adjunct to other analgesics, because they reduce the need for opioids. [2004]

Early Eating and Drinking after CS

Women who are recovering well after CS and do not have complications can eat and drink when they feel hungry or thirsty. [2004]

Urinary Catheter Removal after CS

Removal of the urinary bladder catheter should be carried out once a woman is mobile after a regional anaesthetic and not sooner than 12 hours after the last 'top up' dose. [2004]

Respiratory Physiotherapy after CS

Routine respiratory physiotherapy does not need to be offered to women after a CS under general anaesthesia, because it does not improve respiratory outcomes such as coughing, phlegm, body temperature, chest palpation, and auscultatory changes. [2004]

Length of Hospital Stay and Readmission to Hospital

Length of hospital stay is likely to be longer after a CS (an average of 3-4 days) than after a vaginal birth (average 1-2 days). However, women who are recovering well, are apyrexial, and do not have complications following CS should be offered early discharge (after 24 hours) from hospital and follow-up at home, because this is not associated with more infant or maternal readmissions. [2004]

Recovery Following CS

In addition to general postnatal care, women who have had a CS should be provided with:

- Specific care related to recovery after CS
- Care related to management of other complications during pregnancy or childbirth [2004]

Women who have a CS should be prescribed and encouraged to take regular analgesia for postoperative pain, using:

- For severe pain, co-codamol with added ibuprofen
- For moderate pain, co-codamol
- For mild pain, paracetamol [2004]

CS wound care should include:

- Removing the dressing 24 hours after the CS
- Specific monitoring for fever
- Assessing the wound for signs of infection (such as increasing pain, redness, or discharge), separation, or dehiscence
- Encouraging the woman to wear loose, comfortable clothes and cotton underwear
- Gently cleaning and drying the wound daily
- If needed, planning the removal of sutures or clips [2004]

Healthcare professionals caring for women who have had a CS and who have urinary symptoms should consider the possible diagnosis of:

- Urinary tract infection
- Stress incontinence (occurs in about 4% of women after CS)
- Urinary tract injury (occurs in about 1 per 1000 CS) [2004]

Healthcare professionals caring for women who have had a CS and who have heavy and/or irregular vaginal bleeding should consider that this is more likely to be due to endometritis than retained products of conception. [2004, amended 2011]

Women who have had a CS are at increased risk of thromboembolic disease (both deep vein thrombosis and pulmonary embolism), so health-care professionals need to pay particular attention to women who have chest symptoms (such as cough or shortness of breath) or leg symptoms (such as painful swollen calf). [2004]

Women who have had a CS should resume activities such as driving a vehicle, carrying heavy items, formal exercise, and sexual intercourse once they have fully recovered from the CS (including any physical restrictions or distracting effect due to pain). [2004]

Healthcare professionals caring for women who have had a CS should inform women that after a CS they are not at increased risk of difficulties with breastfeeding, depression, post-traumatic stress symptoms, dyspareunia, and faecal incontinence. [2004]

While women are in hospital after having a CS, give them the opportunity to discuss with their healthcare professionals the reasons for the CS and provide both verbal and printed information about birth options for any future pregnancies. If the woman prefers, provide this at a later date. [new 2011]

Pregnancy and Childbirth after CS

When advising about the mode of birth after a previous CS consider:

- Maternal preferences and priorities
- The risks and benefits of repeat CS
- The risks and benefits of planned vaginal birth after CS, including the risk of unplanned CS [new 2011]

Inform women who have had up to and including four CS that the risk of fever, bladder injuries and surgical injuries does not vary with planned mode of birth and that the risk of uterine rupture, although higher for planned vaginal birth, is rare. [new 2011]

Offer women planning a vaginal birth who have had a previous CS:

- Electronic fetal monitoring during labour
- Care during labour in a unit where there is immediate access to CS and on-site blood transfusion services [2011]

During induction of labour, women who have had a previous CS should be monitored closely, with access to electronic fetal monitoring and with immediate access to CS, because they are at increased risk of uterine rupture (For more information see the NGC summary of Induction of labour [NICE clinical guideline 70]). [2004, amended 2011]

Pregnant women with both previous CS and a previous vaginal birth should be informed that they have an increased likelihood of achieving a vaginal birth than women who have had a previous CS but no previous vaginal birth. [2004]

Clinical Algorithm(s)

The recommendations from this guideline have been incorporated into a NICE pathway .

Scope

Disease/Condition(s)

- Conditions for which women should be offered planned Caesarean section (CS)
- Conditions for which women should not be normally offered planned CS
- Conditions that affect likelihood of CS
- Childbirth

Guideline Category

Counseling

Evaluation

Management

Risk Assessment

Clinical Specialty

Anesthesiology

Family Practice

Internal Medicine

Obstetrics and Gynecology

Pediatrics

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Patients

Physicians

Public Health Departments

Guideline Objective(s)

- This guideline has been developed to help ensure consistent quality care for women who:
  - Have had a caesarean section (CS) in the past and are now pregnant again
  - Have a clinical indication for a CS
  - Are considering a CS when there is no other indication
- To provide evidence based information for healthcare professionals and women about:
  - The risks and benefits of CS compared with planned vaginal birth
  - Specific indications for CS
  - Effective management strategies to avoid CS
  - Anaesthetic and surgical aspects of care
  - Interventions to reduce morbidity from CS
  - Organisational and environmental factors which affect CS rates

Target Population

- Women who plan for or may require a caesarean section, including these subgroups:
  - Women who have had a previous caesarean section
  - Women who are pregnant and human immunodeficiency virus (HIV positive), with high or low viral load
  - Women in labour who require emergency or urgent caesarean section
  - Women who are morbidly obese
- Women with clinical conditions arising during pregnancy, such as pre-eclampsia or gestational diabetes that require specialist care (included in the population for questions relating to morbidly adherent placenta, HIV transmission, maternal request, vaginal birth after caesarean section and timing of prophylactic antibiotics)

Note: This guideline does not cover:

> Pregnant women or babies with rare conditions or with complex or unusual co-morbidities, such as maternal congenital heart disease, that require specialist care

Women with clinical conditions arising during pregnancy, such as pre-eclampsia or gestational diabetes that require specialist care

If the woman is under 16, healthcare professionals should follow the Department of Health guidelines in Seeking consent: working with children .

Interventions and Practices Considered

Making the Decision for Caesarean Section (CS)

1. Providing information on risks and benefits of CS to the pregnant woman in an accessible form
2. Offering planned CS to women based on maternal and neonatal risk
3. Diagnosing morbidly adherent placenta using colour-flow Doppler ultrasound and magnetic resonance imaging (MRI)
4. Reducing likelihood of CS by offering external cephalic version to women with uncomplicated singleton breech pregnancy, offering women continuous support during labour, offering induction of labour beyond 41 weeks, using a partogram with a 4-hour action line in uncomplicated singleton pregnancy, involving a consultant obstetrician in decision for CS, using fetal blood sampling for suspected acidosis
5. Requesting and obtaining consent for CS
6. Timing of planned CS (after 39 weeks' gestation)
7. Documenting urgency of CS
8. Performing emergency CS as soon as possible

Procedural Aspects of CS

1. Preoperative assessment
    - Haemoglobin check
    - Use of indwelling bladder catheter
    - Prescription of antibiotics
    - Prophylaxis for thromboembolism based on risk of thromboembolic disease
2. Anaesthetic care
    - Discussion of post-CS analgesia
    - Offering antacids, H_2 receptor antagonists, or proton pump inhibitors
    - Offering antiemetics
    - Offering regional anaesthesia
    - Reducing risk of hypotension by using
        - Intravenous ephedrine or phenylephrine infusion
        - Volume pre-loading with crystalloid or colloid
        - Lateral lift of 15 degrees
    - Preoxygenation, cricoid pressure and rapid sequence induction during general anaesthesia for emergency CS
    - Maternity unit drills for failed intubation
3. Surgical techniques
    - Use of double gloves in women who are human immunodeficiency virus (HIV) positive
    - Use of transverse lower abdominal incision
    - Use of blunt extension of the uterine incision
    - Use of oxytocin
    - Use of controlled cord traction for removal of the placenta
    - Closure of incision with two suture layers
    - Checking of umbilical artery pH
    - Considering woman's preference for birth environment and facilitating skin-to-skin contact for mother and baby
4. Postoperative monitoring, including monitoring of cardiorespiratory stability, degree of sedation, and pain control
5. The resuscitation of the newborn at CS with a general anaesthetic or with presumed fetal compromise
6. Care of women and baby after CS, including support for breastfeeding, supplemental analgesia, wound care, discharge options
7. Monitoring of recovery following CS, including wound care and maintaining vigilance for complications
8. Discussion of implications for future vaginal births

Note: Grouping and saving of serum, cross-matching of blood, clotting screen, and preoperative ultrasound to localize the placenta are not recommended for healthy women with an uncomplicated pregnancy. The following interventions and procedures are not recommended: closure of

the subcutaneous space (unless >2 cm fat); use of superficial wound drains; use of separate surgical knives for skin and deeper tissues; use of forceps routinely to deliver baby's head; suturing either the visceral or the parietal peritoneum; exteriorising the uterus; manual removal of the placenta.

Major Outcomes Considered

- Diagnostic accuracy of colour-flow ultrasound and magnetic resonance imaging (MRI)
- Maternal outcomes
  - Mortality
  - Blood loss
  - Admission to intensive care units
  - Thromboembolic disease
  - Infection, breastfeeding
  - Women's experiences and satisfaction
  - Psychological sequelae such as postnatal depression
  - Uterine rupture (additional outcome for women having a planned vaginal birth after a previous caesarean section)
  - Hysterectomy (for women diagnosed with a morbidly adherent placenta)
- Baby outcomes
  - 5 minute Apgar score
  - Preterm birth rate
  - Respiratory and neurological complications
  - Length of stay
  - Mother-to-child transmission of human immunodeficiency virus (HIV) (for babies born to HIV-positive women)
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health on behalf of the National Institute for Health and Clinical Excellence (NICE). See the Availability of Companion Documents field for the full version of this guidance.

Methodology for 2011 Update

This guidance update was developed in accordance with the guideline development process outlined in the 2009 edition of The Guidelines Manual (see the 'Availability of Companion Documents' field).

The Guideline Development Group (GDG) formulated review questions based on the scope (see Appendix A of the full version of the original guideline document) and prepared a protocol for each review question (Appendix D of the full version of the guideline). These formed the starting point for systematic reviews of relevant evidence. Published evidence was identified by applying systematic search strategies (Appendix E of the full version of the guideline) to the following databases: Medline, Medline In-Process, EMBASE, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and three Cochrane databases (Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews and the Database of Abstracts of Reviews of Effects). Searches to identify economic studies were undertaken using Medline, EMBASE, the Cochrane Central Register of Controlled Trials, the National Health Service (NHS) Economic Evaluation Database (NHS EED) and the Health Technology Assessment (HTA) database. Dates of searching and database coverage are given with the details of the search strategies in Appendix E.

Where appropriate, review questions were grouped together for searching. Animal studies were excluded from Medline and both Medline and

EMBASE were limited to English-language studies only. Searches designed to update sections of the existing guideline were limited to 2003 onwards; searches for new review areas were not limited by date. Scottish Intercollegiate Guidelines Network (SIGN) search filters were used to identify particular study designs, such as randomised controlled trials (RCTs). There was no systematic attempt to search grey literature (conference abstracts, theses or unpublished trials), nor was hand searching of journals not indexed on the databases undertaken. Towards the end of the guideline development process, the searches were updated and re-executed to include evidence published and indexed in the databases by 17 March 2011.

Incorporating Health Economics

The GDG prioritised a number of review questions where it was thought that economic considerations would be particularly important in formulating recommendations. Systematic searches for published economic evidence were undertaken for these questions.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations, Assessment, Development and Evaluation (GRADE)

Quality Element	Description
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health on behalf of the National Institute for Health and Clinical Excellence (NICE). See the Availability of Companion Documents field for the full version of this guidance.

This guidance was developed in accordance with the methods outlined in the NICE Guidelines Manual 2009 (see the Availability of Companion Documents field).

Reviewing and Synthesising the Evidence

Evidence relating to clinical effectiveness was reviewed and synthesised according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (see http://www.gradeworkinggroup.org/index.htm). In the GRADE approach, the quality of the evidence identified for each outcome listed in the review protocol is assessed according to the factors listed below and an overall quality rating (high, moderate, low or very low) is assigned by combining the ratings for the individual factors.

- Study design (as an indicator of intrinsic bias; this determines the initial quality rating)
- Limitations in the design or execution of the study (including concealment of allocation, blinding, loss to follow up; these can reduce the quality rating)
- Inconsistency of effects across studies (this can reduce the quality rating)
- Indirectness (the extent to which the available evidence fails to address the specific review question; this can reduce the quality rating)
- Imprecision (this can reduce the quality rating)
- Other considerations (including large magnitude of effect, evidence of a dose–response relationship, or confounding variables likely to have reduced the magnitude of an effect; these can increase the quality rating in observational studies, provided no downgrading for other features has occurred)

The type of review question determines the highest level of evidence that may be sought. For issues of therapy or treatment, the highest possible evidence level is a well-conducted systematic review or meta-analysis of RCTs, or an individual RCT. In the GRADE approach, a body of evidence for a given outcome based entirely on such studies has an initial quality rating of high, and this may be downgraded to moderate, low or very low if factors listed above are not addressed adequately. For issues of prognosis, the highest possible level of evidence is a controlled observational study (a cohort study or case–control study), and a body of evidence for a particular outcome based on such studies would have an initial quality rating of low, which might be downgraded to very low or upgraded to moderate or high, depending on the factors listed above.

For each review question the highest available level of evidence was sought. Where appropriate, for example, if a systematic review, meta-analysis or RCT was identified to answer a question directly, studies of a weaker design were not considered. Where systematic reviews, meta-analyses and RCTs were not identified, other appropriate experimental or observational studies were sought. For diagnostic tests, test evaluation studies examining the performance of the test were used if the accuracy of the test was required, but where an evaluation of the effectiveness of the test in the clinical management of the condition was required, evidence from RCTs or cohort studies was optimal.

For studies evaluating the accuracy of a diagnostic test, sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and likelihood ratios for positive and negative test results (LR+ and LR–, respectively) were calculated or quoted where possible (see Table 3.3 of the full version of the original guideline document).

Some studies were excluded from the guideline reviews after obtaining copies of the corresponding publications because they did not meet inclusion criteria specified by the GDG and recorded in the protocol (see Appendix D of the full version of the original guideline). The characteristics of each included study were summarised in evidence tables for each review question (see Appendix G of the full version of the guideline). Where possible, dichotomous outcomes were presented as risk ratios (RRs) or odds ratios (ORs) with 95% confidence intervals (CIs), and continuous outcomes were presented as mean differences with 95% CIs or standard deviations (SDs).

The body of evidence identified for each review question (or part of a review question) was presented in the form of a GRADE evidence profile summarising the quality of the evidence and the findings (pooled relative and absolute effect sizes and associated CIs). Summary GRADE tables have been reported in the main text, with the full GRADE evidence profiles reported in Appendix H of the full version of the original guideline document. Where possible, the body of evidence corresponding to each outcome specified in the review protocol was subjected to quantitative meta-analysis. In such cases, pooled effect sizes were presented as pooled RRs, pooled ORs or weighted mean differences. By default, meta-analyses were conducted by fitting fixed effects models, but where statistically significant heterogeneity was identified, random effects models were used. Where quantitative meta-analysis could not be undertaken (for example, because of heterogeneity in the included studies), the range of effect sizes reported in the included studies was presented.

Health Economics

For economic evaluations, no standard system of grading the quality of evidence exists and included papers were assessed using a quality assessment checklist based on good practice in economic evaluation. Reviews of the (very limited) relevant published health economic literature are presented alongside the clinical effectiveness reviews.

Methods Used to Formulate the Recommendations

Expert Consensus (Nominal Group Technique)

Informal Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health on behalf of the National Institute for Health and Clinical Excellence (NICE). See the Availability of Companion Documents field for the full version of this guidance.

This guidance was developed in accordance with the methods outlined in the NICE Guidelines Manual 2009 (see the Availability of Companion Documents field). The Centre established a Guideline Development Group (GDG) (see Appendix A in the full version of the original guideline document), which reviewed the evidence and developed the recommendations. An independent Guideline Review Panel oversaw the development of the guideline (see Appendix B in the full version of the original guideline document).

Evidence to Recommendations

For each review question recommendations for clinical care were derived using, and linked explicitly to, the evidence that supported them. In the first instance, short clinical and, where appropriate, cost effectiveness evidence statements were drafted by the technical team and presented alongside the evidence profiles, and then agreed by the GDG. Statements summarising the GDG's interpretation of the evidence and any extrapolation from the evidence used to form recommendations were also prepared to ensure transparency in the decision-making process. The criteria used in moving from evidence to recommendations are summarised as:

- Relative value placed on the outcomes considered
- Consideration of clinical benefits and harms
- Consideration of net health benefits and resource use
- Quality of the evidence
- Other considerations (including equalities issues)

In areas where no substantial clinical research evidence was identified, the GDG members considered other evidence-based guidelines and consensus statements or used their collective experience to identify good practice. The health economics justification in areas of the guideline where the use of National Health Service (NHS) resources (interventions) was considered was based on GDG consensus in relation to the likely implications for cost effectiveness of the recommendations. The GDG also identified areas where evidence to answer its review questions was lacking and used this information to formulate recommendations for future research.

Towards the end of the guideline development process, formal consensus methods incorporating anonymous voting were used to consider all the clinical care recommendations and research recommendations that had been drafted previously. The GDG identified ten 'key priorities for implementation' (key recommendations) and five high-priority research recommendations. The key priorities for implementation were those recommendations thought likely to have the biggest impact on clinical care and outcomes in the NHS as a whole. The priority research recommendations were selected in a similar way.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

Incorporating Health Economics

The aims of the health economic input to the guideline were to inform the Guideline Development Group (GDG) of potential economic issues relating to caesarean section (CS) and to ensure that recommendations represented a cost-effective use of healthcare resources. Health economic evaluations aim to integrate data on benefits (ideally in terms of quality adjusted life years [QALYs]), harms and costs of different care options.

Health economic considerations were aided by original economic analysis undertaken as part of the development process. For this guideline the areas prioritised for economic analysis were:

- Diagnosis of morbidly adherent placenta (see Sections 5.6 for summary and 13.2 for full details in the full version of the original guideline document)

- Maternal request for CS (see Sections 5.9 for summary and 13.3 for full details in the full version of the original guideline document)
- Vaginal birth after CS (see Sections 11.2 for summary and 13.4 for full details in the full version of the original guideline document).

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Registered stakeholder organisations were invited to comment on the draft scope and the draft guideline. Stakeholder organisations were also invited to undertake a pre-publication check of the final guideline to identify factual inaccuracies. The GDG carefully considered and responded to all comments received from stakeholder organisations. The comments and responses, which were reviewed independently for NICE by a Guidelines Review Panel, are published on the NICE website.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

General Benefits

- Consistent quality of care for women considering caesarean section (CS)
- Improved diagnosis of morbidly adherent placenta which allows clinicians to be prepared and to ensure that appropriate measures are taken, improving maternal and fetal outcomes

Potential Reductions in the Following for Planned CS

- Perineal and abdominal pain during birth and 3 days postpartum
- Injury to vagina
- Early postpartum haemorrhage
- Obstetric shock

Subgroups Most Likely to Benefit

- Women with a placenta that partly or completely covers the internal cervical os (minor or major placenta praevia) should be offered CS.
- Pregnant women with a singleton breech presentation at term, for whom external cephalic version is contraindicated or has been unsuccessful, should be offered caesarean section (CS) because it reduces perinatal mortality and neonatal morbidity.
- Human immunodeficiency virus (HIV)-positive women who are pregnant and are not receiving any anti-retroviral therapy or are receiving any anti-retroviral therapy and have a viral load of 400 copies per ml or more should be offered a planned CS because it reduces the risk of mother-to-child transmission of HIV.
- Pregnant women who are co-infected with hepatitis C virus and HIV should be offered planned CS because it reduces mother-to-child transmission of both hepatitis C virus and HIV.
- Women with primary genital herpes simplex virus infection (HSV) occurring in the third trimester of pregnancy should be offered planned CS because it decreases the risk of neonatal HSV infection.

Potential Harms

- Complications of caesarean section (CS) include anaesthesia risks; blood loss during surgery; postoperative wound or urinary tract infections, endometritis pain, and venous thromboembolism; stress incontinence or urinary and genital tract injury; and fetal laceration.
- Planned CS may increase the risk of neonatal intensive care unit admission.
- CS is associated with a longer hospital stay, hysterectomy caused by postpartum haemorrhage, and cardiac arrest.
- Please refer to tables 1 and 2 in appendix C in the original guideline document for full details, including the absolute and relative risks for each effect.
- The documented side effects of intrathecal morphine include itching, nausea and vomiting.

Contraindications

Contraindications

Contraindications to fetal blood sampling include maternal infection (such as human immunodeficiency virus [HIV], hepatitis viruses, or herpes simplex virus); fetal bleeding disorders such as haemophilia; and prematurity (less than 34 weeks). Where there is clear evidence of acute fetal compromise (e.g., prolonged decelerations [longer than 3 minutes]), fetal blood sampling should not be undertaken and the baby should be delivered urgently.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of the National Institute for Health and Clinical Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.
- The guideline has not sought to define acceptable caesarean section rates. Rather the purpose of this guideline is to enable healthcare professionals to give appropriate research-based advice to women and their families. This will enable women to make properly informed decisions.

Implementation of the Guideline

Description of Implementation Strategy

Key Priorities for Implementation

The following recommendations have been identified as priorities for implementation.

Morbidly Adherent Placenta

If a colour-flow Doppler ultrasound scan result suggests morbidly adherent placenta:

- Discuss with the woman the improved accuracy of magnetic resonance imaging (MRI) in addition to ultrasound to help diagnose morbidly adherent placenta and clarify the degree of invasion

- Explain what to expect during an MRI procedure
- Inform the woman that current experience suggests that MRI is safe, but that there is a lack of evidence about any long term risks to the baby
- Offer MRI if acceptable to the woman. [new 2011]

Mother-to-Child Transmission of Human Immunodeficiency Virus (HIV)

Do not offer a caesarean section (CS) on the grounds of HIV status to prevent mother-to-child transmission of HIV to:

- Women on highly active anti-retroviral therapy (HAART) with a viral load of less than 400 copies per ml or
- Women on any anti-retroviral therapy with a viral load of less than 50 copies per ml

Inform women that in these circumstances the risk of HIV transmission is the same for a CS and a vaginal birth. [new 2011]

Maternal Request for CS

When a woman requests a CS because she has anxiety about childbirth, offer referral to a healthcare professional with expertise in providing perinatal mental health support to help her address her anxiety in a supportive manner. [new 2011]

For women requesting a CS, if after discussion and offer of support (including perinatal mental health support for women with anxiety about childbirth), a vaginal birth is still not an acceptable option, offer a planned CS. [new 2011]

An obstetrician unwilling to perform a CS should refer the woman to an obstetrician who will carry out the CS. [new 2011]

Decision-to-Delivery Interval for Unplanned CS

Use the following decision to delivery intervals to measure the overall performance of an obstetric unit:

- 30 minutes for category 1 CS*
- Both 30 and 75 minutes for category 2 CS

Use these as audit standards only and not to judge multidisciplinary team performance for any individual CS. [new 2011]

*Category 1 CS is when there is immediate threat to the life of the woman or fetus, and category 2 CS is when there is maternal or fetal compromise which is not immediately life threatening.

Timing of Antibiotic Administration

Offer women prophylactic antibiotics at CS before skin incision. Inform them that this reduces the risk of maternal infection more than prophylactic antibiotics given after skin incision, and that no effect on the baby has been demonstrated. [new 2011]

Offer women prophylactic antibiotics at CS to reduce the risk of postoperative infections. Choose antibiotics effective against endometritis, urinary tract and wound infections, which occur in about 8% of women who have had a CS. [2004, amended 2011]

Do not use co-amoxiclav when giving antibiotics before skin incision. [new 2011]

Recovery following CS

While women are in hospital after having a CS, give them the opportunity to discuss with healthcare professionals the reasons for the CS and provide both verbal and printed information about birth options for any future pregnancies. If the woman prefers, provide this at a later date. [new 2011]

Pregnancy and Childbirth after CS

Inform women who have had up to and including four CS that the risk of fever, bladder injuries and surgical injuries does not vary with planned mode of birth and that the risk of uterine rupture, although higher for planned vaginal birth, is rare. [new 2011]

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

National Institute for Health and Clinical Excellence (NICE). Caesarean section. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Nov. 57 p. (Clinical guideline; no. 132).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2004 Apr (revised 2011 Nov)

Guideline Developer(s)

National Collaborating Centre for Women's and Children's Health - National Government Agency [Non-U.S.]

Source(s) of Funding

National Institute for Health and Clinical Excellence (NICE)

Guideline Committee

Guideline Development Group

Composition of Group That Authored the Guideline

Guideline Development Group Members: Malcolm Griffiths (*Chair*), Consultant obstetrician and gynaecologist, Luton and Dunstable Hospital, Luton; Debbie Chippington Derrick, Lay member; Olujimi Jibodu, Consultant obstetrician and gynaecologist, York Hospital NHS Foundation Trust; Christine Johnson, Lay member; Nina Khazaezadeh, Consultant midwife, St Thomas' Hospital, London; Andrew Loughney, Consultant obstetrician, Royal Victoria Infirmary, Newcastle Hospitals NHS Foundation Trust; Nuala Lucas, Consultant anaesthetist, Northwick Park Hospital, London; Pippa Nightingale, Head of Midwifery, Imperial College Healthcare NHS Trust, London

Financial Disclosures/Conflicts of Interest

All Guideline Development Group (GDG) members' interests were recorded on declaration forms provided by the National Institute for Health and Clinical Excellence (NICE). The form covered consultancies, fee-paid work, shareholdings, fellowships and support from the healthcare industry. GDG members' interests are listed in Appendix C of the full version of the original guideline. No material conflicts of interest were identified.

Guideline Status

This is the current release of the guideline.

The guideline updates a previous version: National Collaborating Centre for Women's and Children's Health. Caesarean section. London (UK): National Institute for Clinical Excellence (NICE); 2004 Apr. 142 p.

Guideline Availability

Electronic copies: Available from the National Institute for Health and Clinical Excellence (NICE) Web site .

Availability of Companion Documents

The following are available:

- Caesarean section. Full guideline. London (UK): National Institute for Clinical Excellence (NICE); 2011 Nov. 276 p. (Clinical guideline; no. 132). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .
- Caesarean section. Appendices. London (UK): National Institute for Clinical Excellence (NICE); 2011 Nov. Various p. (Clinical guideline; no. 132). Electronic copies: Available in PDF from the NICE Web site .
- NICE Pathways. Caesarean section. Electronic copies: Available from the NICE Web site .
- Caesarean section. Clinical audit tools. National Institute for Health and Clinical Excellence (NICE); 2011 Nov. Various p. (Clinical guideline; no. 132). Electronic copies: Available from the NICE Web site .
- Caesarean section. Electronic audit tool. National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 132). Electronic copies: Available from the NICE Web site .
- Caesarean section. Costing report. National Institute for Health and Clinical Excellence (NICE); 2011 Nov. 37 p. (Clinical guideline; no. 132). Electronic copies: Available in PDF from the NICE Web site .
- Caesarean section. Costing template. National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 132).

Electronic copies: Available from the NICE Web site .

- Caesarean section. Slide set. National Institute for Health and Clinical Excellence (NICE); 2011 Nov. 20 p. (Clinical guideline; no. 132). Electronic copies: Available from the NICE Web site .
- Caesarean section. Baseline assessment tool. National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 132). Electronic copies: Available from the NICE Web site .
- Caesarean section. Clinical case scenarios for obstetricians. National Institute for Health and Clinical Excellence (NICE); 2011. 25 p. (Clinical guideline; no. 132). Electronic copies: Available in PDF from the NICE Web site .
- Caesarean section. Clinical case scenarios for obstetricians. Slide set. National Institute for Health and Clinical Excellence (NICE); 2011. 32 p. (Clinical guideline; no. 132). Electronic copies: Available from the NICE Web site .
- Caesarean section. Podcast. National Institute for Health and Clinical Excellence (NICE); 2011 Nov. Electronic copies: Available from the NICE Web site .
- The guidelines manual 2009. London (UK): National Institute for Health and Clinical Excellence (NICE); 2009 Jan. Electronic copies: Available in PDF from the NICE Archive Web site .

Patient Resources

The following is available:

- Caesarean section. Understanding NICE guidance. Information for people who use NHS services. National Institute for Health and Clinical Excellence (NICE); 2011 Nov. 20 p. (Clinical guideline; no. 132). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site . Also available in Welsh from the NICE Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI on July 9, 2004. The information was verified by the guideline developer on December 3, 2004. This summary was updated on May 3, 2005 following the withdrawal of Bextra (valdecoxib) from the market and the release of heightened warnings for Celebrex (celecoxib) and other nonselective nonsteroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI on June 16, 2005, following the U.S. Food and Drug Administration advisory on COX-2 selective and non-selective non-steroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI Institute on June 22, 2007 following the U.S. Food and Drug Administration (FDA) advisory on heparin sodium injection. This summary was updated by ECRI Institute on March 13, 2008 following the updated FDA advisory on heparin sodium injection. The information was reaffirmed by the guideline developer on May 18, 2009 and updated by ECRI Institute on March 31, 2010. This summary was updated by ECRI Institute on July 26, 2010 following the U.S. Food and Drug Administration (FDA) advisory on Proton Pump Inhibitors (PPI). This summary was updated by ECRI Institute on March 16, 2011 following the U.S. Food and Drug Administration advisory on acetaminophen-containing prescription products. This NGC summary was updated by ECRI Institute on June 25, 2012. This summary was updated by ECRI Institute on October 28, 2013 following the U.S. Food and Drug Administration advisory on Acetaminophen. This summary was updated by ECRI Institute on March 10, 2014 following the U.S. Food and Drug Administration advisory on Low Molecular Weight Heparins. This summary was updated by ECRI Institute on September 18, 2015 following the U.S. Food and Drug Administration advisory on non-aspirin nonsteroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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